

WHAT IS CLAIMED IS:

1. A multi-directional ball switch comprising:

5       a panel(2) having 4 diagonally-located fixtures(9~12), each of which has an orthogonal shaft-hole(14);  
a ball knob(3) placed on said panel(2);  
a conversion means(4) that transforms the  
10      rotation of said ball knob(3) into an electric signal;  
a CPU(6) that is connected to said conversion means(4) and to a sound generation section(5);  
a switching section(7) that restrains the  
15      rotation of said ball knob(3) and generates an output value from said CPU(6); and  
a signal generation section(6b) connected to said CPU(6).

20      2. A multi-directional ball switch as claimed in claim 1,

wherein said conversion means(4) comprises:

4 rotation shafts(26~29) that are inserted into the shaft holes(14) of said 4 fixtures(9~12)  
25      respectively; and

4 click encoders(22~25) into which ends of said  
4 rotation shafts(26~29) are inserted  
respectively;  
wherein bottoms of said 4 click encoders(22~25)  
5 are fixed on said panel(2)

3. A multi-directional ball switch as claimed  
in claim 1,

wherein said sound generation section(5) is  
10 established to generate different  
characteristic sounds through a speaker(5a)  
according to the directions of movements of  
said ball knob(3) such as up, down, left, right  
and press.

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4. A multi-directional ball switch as claimed  
in claim 1,

wherein said switching section(7) comprises:

a supporting plate(33) having a hinge  
20 hole(33a);  
a hinge shaft(34) that is inserted into said  
hinge hole(33a);  
a stopper(38) that is equipped with a  
supporting ball(36) located at the center of  
25 said supporting plate(33); and

a press sensor(39) that is installed between the top of free-end of said supporting plate(33) and the down surface of said panel(2).

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5. A multi-directional ball switch as claimed in claim 2,

wherein said rotation shafts(26~29) are installed to support both sides of said ball knob(3) so that said ball knob(3) can rotate only one direction of up/down or left/right at a time.

10 6. A multi-directional ball switch as claimed in claim 2,

15 wherein said 4 click encoders(22~25) are constructed to generate a click sound or a click vibration while said rotation shafts(26~29) are rotating.

20 7. An operation method of a multi-directional ball switch characterized in that, for the case of map-search on Internet, a cursor is scrolled into 4 directions on the map, and at said scrolled position, a designated portion of said map is enlarged or contracted by moving said

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ball knob upward or downward in a pressing state.

8. An operation method of a multi-directional ball switch characterized in that, for the case of web-search on Internet, a cursor is quickly moved into a prescribed position of a search window or an execution command indicated on web page by rotating a ball knob to up/down/left/right directions, and a web-search window can be changed by rotating said ball knob to up/down/left/right directions with being pressed.

9. An operation method of a multi-directional ball switch characterized by, for the case of inputting Korean alphabet, moving a ball knob upward to select a consonant input mode, scrolling said ball knob upward/downward to select a desired consonant, and thereafter selecting a desired vowel by using the short/long movements of said ball knob to the right and/or downward directions.